REPORT
of the Digital Elevation Model Science Working Group (DEM/SWG)

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SUMMARY OF DEM/SWG GOALS

- Insure Required DEM Datasets and their Derivatives are Available for AM-1 Platform Launch in 1998.
- Insure the Progress/Availability of DEM Access Software.
- Support Other MTPE Activities Requiring DEM and Auxiliary Dataset Information.

APPROACH

- Identify Required DEM Resolutions
  - 1km. and 100m. (500m and 30m deleted)
- Identify DEM Producers, Production Schedules, and Data Availability.
- Identify and Perform Trade Studies to Refine Requirements, Formats, and Derived DEM Products for EOS Instruments.

CURRENT STATUS OF DEM PRODUCTION

- **1 km DEM Global Coverage**
  - EDC and MISR 1km DEM datasets completed in 1996.
  - Estimated average accuracy of the two datasets is 41m RMS.
  - EDC dataset available to users since February 1997 in binary format.
  - Availability in HDF-EOS GRID format expected in mid-1997.
- **100m DEM Global Coverage**
  - EDC and MISR 100m DEM datasets completed in 1996.
  - USA datasets available now via FTP from EDC in binary format.
  - 35% of Global Land area WILL NOT be available at 100m until after 2000.
  - EOS-wide permission to use restricted DOD 100m DEM data is being pursued by V. Griffin.
- **Auxiliary DEM Datasets**
  - MISR Land/Water Mask Selected by the DEM/SWG for EOS use in NOV96.
  - DEM Source/Accuracy Metadata Contents Defined.
  - Slope and Topo Obscuration/Shadow Algorithms In Progress.

RECENT DEM/SWG ACTIVITIES/ACCOMPLISHMENTS

- Prototype SDP Toolkit Calls from ECS available for testing since 25MAR97.
  - SDP Toolkit Calls read/access HDF-EOS GRID format DEM datasets.
  - HDF-EOS GRID test files provided with prototype toolkit calls.
  - DEM/Auxiliary Datafiles available in HDF-EOS GRID format in mid-97.
    - ECS will develop binary-to-HDF conversion software.
    - EDC will perform binary-to-HDF data conversions.
- Updated DEM AUXILIARY DATASETS PREPARATION PLAN
  - Update DEM Plan Document sent out 18JAN97 for review.
  - Feedback comments received; minor changes will be made.
  - Document includes preliminary signature page.
  - Document sign-off expected in mid-1997.

Trade Study #1: SDP Toolkit Calls for DEM Datasets

- **Purpose:** Identify the SDP Toolkit Call requirements for accessing DEM and DEM/Auxiliary datasets.
- DEM/SWG concensus achieved 10MAY96.
- **Recommendation:** Identified and defined read/access calls, data types, and data units.
- **Resolution:** DEM Toolkit Calls Accepted by ECS, and Prototype Toolkit Calls provided 25MAR97 for testing.

Trade Study #2: DEM Raster Tiling Scheme Assessment

- **Purpose:** Evaluate the data access efficiency for raster tiling schemes and identify the preferred design approach.
- DEM/SWG concensus achieved 03JUL96.
- **Recommendations:** Tiling recommended; 3x faster access. Recommended GeoTIFF format.
- **Resolution:** ESDIS/ECS accepted DEM/SWG tiling recommendation; selected HDF-EOS GRID for DEM file format.

Trade Study #3: Slope/Aspect Auxiliary Dataset Algorithms

- **Purpose:** Identify the best algorithms for preparing topographic slope gradient and aspect datasets.
- **Remaining Issues:**
  - Determine the best algorithm for EOS.
  - Algorithm adjustments for slopes generated from 1km DCW sources versus 100m DTED.
- **Resolution:** Expected in JUN97.

Trade Study #4: Land/Water Mask Options

- **Purpose:** Identify the most appropriate Land/Water mask for general EOS use.
- **Resolution:** MISR definition selected 27NOV96.
  - Seven Classes (Deep and Shallow Ocean; Deep and Shallow Lakes; Coastline/Shoreline; Land; Ephemeral Lakes)
  - Available from EDC in SEP97; Available now by special request.

Trade Study #5: Terrain Obscuration and Shadow Derivation

- **Purpose:** Identify the best algorithms for preparing topographic obscuration and shadow masks.
- Obscuration requested by MODIS; Shadow by TRMM & ASTER.
- Study Lead by MODIS (R. Wolfe).
- **Resolution:** Completion Expected by MAY97.

Trade Study #6: DEM Accuracy and Dataset "Melding"

- **Purpose:** Assess the vertical accuracy of the 1km EDC/MISR DEM datasets.
- Lead by University College London (J-P. Muller).
- Initial results indicate that both datasets have the same basic accuracy and error factors (~41m RMS).
- No "melding" required; consider each as more-or-less the same.
- **Resolution:** Final analysis expected in APR/MAY97.

Current DEM Plan Schedule

SECT	ACTIVITY	ORG	1996 FY96 1	2	3	4	1997 FY97 1	2	3	4
4.1	LAUNCHES									TRMM ▼
6.1	DEM DATA PREPARATION									
6.1.1	— 1km Global DEM†	EDC						▼		▼
6.1.2	— 100m USA DEM (USGS)	EDC						▼		
6.1.3	— USA Test Site DEMs	EDC							▼	
6.1.4	— GlobalTest Site DEMs	EDC							▼	
6.1.5	— 100m Global DEM (DTED)	EDC							▼	
6.2	AUXILIARY DATA PREPARATION									
6.2.1	— 1km Global Dataset†	EDC								▼
6.2.2	— 100m USA Dataset (USGS)	EDC								▼
6.2.3	— USA Test Site Datasets	EDC							▼	
6.2.4	— Global Test Site Datasets	EDC							▼	
6.2.5	— 100m Global DEM (DTED)	EDC								▼
6.3	SDP ACCESS TOOLS	ECS					▼	▼	▼	
6.4	DEM PLAN Document Updates	JPL		▼				▼		▼
5.2.x	TRADE STUDIES (By Number)	JPL			▼ 1	▼ 2	▼ 4		▼ 6	▼ 5 ▼ 3

NOTES: †65% of World from DTED; 35% from DCW/Other
SRTM Release to Public Expected in Late-2000

03APR97

Summary / Plans

- Monitor current DEM/SDP Toolkit Calls software development by ECS.
- Monitor ECS development of HDF-EOS GRID data file format.
- Complete Slope and Topo Obscuration/Shadow algorithm Trade Studies.
- Submit "final" DEM Plan Document in Mid-1997 for signature.
- Obtain EOS-wide permission from NIMA to use DTED-1 (V. Griffin).
- Continue monitoring the disposition of DEM/SWG recommendations.